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ABSTRACT

The relevance of intelligence testing for schools within one district, the Sacramento (California) school district and the state of California is explored, and applications of intelligence theory in district schools and classrooms are discussed. Intelligence, for purposes of this discussion, is the aggregate capacity of each student's intelligence, the combination of abilities that are quantitatively different, and the way the student uses these abilities to deal with the environment. California allowed group and individual intelligence testing until the 1960s, but no longer allows group intelligence testing for students. Individual students are tested to identify the gifted or for other educational diagnoses. In the Sacramento City Unified School District intelligence tests are used for the same purposes, to identify the gifted and special education students. Self-efficacy theory and the theory of multiple intelligences are being applied in the intelligence assessment of students in the district. Much that is good is being recognized about intelligence, but many practices reflect the negative influences of believing that intelligence is fixed at an early age. (Contains 7 references.) (SLD)

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On the Relevance of Intelligence: Applications for Classrooms?

Intelligence Testing: The Good, the Bad and the Ugly

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Part I: Introduction And Purpose Of Presentation

The purpose of this presentation is to describe the relevance of intelligence testing for schools within one district & one state and the applications of intelligence theory in district schools and classrooms.

While the first session in this "strand" of sessions was theoretical and research-based, the second set of presentations is focused on applications of intelligence testing and theory. This presentation will give you a viewpoint about intelligence testing and its application from a single school district in a single state. The information which I will share with you may be from a single district, but I believe it will touch on issues that are of concern to all of us in education.

Why be concerned about intelligence?

Before describing the practices related to intelligence testing in my district and state, I want to say why we are even concerned about intelligence. There appear to be two main applications of intelligence in the public schools. One of these applications is measuring intelligence for student identification, as it was for Binet. Our range of identification today is broader than Binet's time, because it includes students at both ends of the "intelligence continuum," identifying both those who are "mentally challenged" and those who challenge us with their mental ability. The second is the application of intelligence theory in schools—its bearing on how students learn. Each of these reasons will be discussed more fully in this paper.

Definition of Intelligence

While this is not a theoretical paper, it may be helpful to define my interpretation of "intelligence." I draw upon the early work of Wechsler for my definition.

"Intelligence is the aggregate or global capacity of the individual to act purposefully, to think rationally and to deal effectively with his environment."

For some of us in public schools, the meaning of intelligence is frequently students' capacity to master the learning tasks that are assigned to them in school. Such an interpretation is too limiting for me. My interpretation of intelligence stresses the "aggregate" capacity of each students' intelligence—the combining of abilities that are qualitatively different—and the way that each student uses these abilities to deal effectively with his environment.

I do not support the aphorism that "intelligence is that thing which an intelligence test measures." I believe that intelligence is what we use in navigating the mental processes of life. As such, it may differ for individuals, even as we find differences in individual abilities in physical, social or emotional areas of life.

My developmental viewpoint considers intelligence as variable, not fixed and not the same for every person. Intelligence testing then becomes a tool to help us determine ways in which individuals differ mentally, just as cholesterol testing is a tool to help us determine the physical status of lipoproteins in the blood of each individual. Let me use this physical measurement analogy to help illustrate my view of intelligence.

Early cholesterol tests and the cheap, quick cholesterol tests today do not differentiate types of lipoproteins, only the global amount present. Later and more extensive cholesterol tests help us to see that we might have more of the high-density lipoproteins, or less of the low-density lipoproteins. Even knowing one's multiple lipoprotein measurement as of one date does not mean that it is unchangeable. We have found that various life factors can influence a cholesterol reading—that it can change based upon factors such as diet, medication and exercise. There also seems to be a component that is genetically determined and is less influenced by these external or environmental factors.

Similarly, I believe that different intelligence measurements may have useful applications in diagnosing the status of individual mental functioning. I do not support the belief of a static, once-measured, never-changing ability. How, then, can intelligence measurements be used? My answers to this question form the remainder of my presentation.

Part II: State Practices

Before discussing district practices, I want to set the stage for both state and local district practices by providing some history. The historical perspective that I have to present includes my personal experiences as well as more generally known history.

General practice in California

California did allow group and individual intelligence testing for students without restriction until the 1960's. When I was in high school, our standardized testing program included a mental abilities component, and I recall being informed by a broken line graph that went up and down like the Sierra mountains, that my IQ was at the 98th or 99th percentile. The interpretation of this information was that I was probably "college material."

Today, California no longer allows the use of group intelligence testing for students. This decision was handed down by the courts as a result of the *Larry P. vs. SDE* case. This case came before Judge Peckham of the Federal District Court in 1972. Larry was a black student who had been identified and placed into special education on the basis of a single IQ test score. The student's parents opposed this identification on the basis of test data being prejudicial and unreliable.

The Court's ruling led to a prohibition on the use of any group intelligence testing within California from which a single score purporting to be an IQ score could be given.

Personal experiences with intelligence testing in California

In the years following this prohibition, I had personal experiences related to the use of individual intelligence tests for identifying students as mentally gifted. For a time I was director of a district program for mentally gifted students and reviewed psychologists' reports of intelligence testing. As a mother, I was interested in such testing because I had a son who was so verbal that many proclaimed him as "gifted." Apart from the fact that he had extreme difficulty in writing even his name, his Stanford-Binet test score did show that he qualified as mentally gifted. His linguistic and quantitative abilities were so exceptional

that his sister paled by comparison. When it was time to test her, I told the psychologist that I did not want her identified unless her scores were well within the gifted range. I was surprised when her Wechsler Intelligence Scale for Children (WISC) showed her extremely high in manipulative (bodily-kinesthetic) and spatial abilities—enough so that she, too, was identified as gifted.

This difference in apparent and tested abilities between my two children led to my further interest in the area of intelligence testing. I had first-hand understanding of the varieties of intelligence and the role of intelligence testing in determining differences in intelligence and mental functioning.

As a doctoral student at University of Southern California, I was exposed to Guilford's Structure of Intellect model. While this model could identify 150 types of intelligence, it was nearly impossible to apply, either as a construct for intelligence or by a teacher working with gifted students. Although I found the structure of intellect difficult to apply, I was beginning to develop an appreciation of intelligence testing as a tool for diagnosis. This understanding of intelligence and the usefulness of intelligence testing was not based upon theory, but upon my experiences with students and in the classroom.

As I concluded my doctorate, I secured a position as an evaluator for special education programs in a large Northern California school district. In this role I continued to find a use for individual intelligence testing to identify students with more limited intellectual functioning. As part of my job I became involved in defining and operationalizing the criteria for so-called "specific learning disability" students. Because of the prohibition on use of group tests for determining IQ and the limited availability of individual testing by psychologists, we had to find alternative methods for deciding if a "discrepancy" existed between a student's "ability" and his/her achievement in one or more areas. We used tests of achievement which also assessed ability, but which did not provide a single, unitary IQ score.

Over ten years ago I moved from working exclusively with special education programs to my present district position where I oversee group testing and the evaluation of a variety of district programs. In my current position I have found three program ideas that change the way in which we apply and think of intelligence in the district. These programs are self-efficacy, applications of multiple intelligence (and, to a lesser extent, Robert J. Sternberg's learning styles). I will discuss the two major programs in the next section on my district and district practices related to intelligence testing and applications.

Part III: Practices in Sacramento

Overview of district—its demographics and general achievement

Now I would like to frame this presentation within my own school district. As I mentioned earlier, the Sacramento City Unified School District has many of the characteristics of larger urban school districts. Our enrollment is just shy of 50,000 students. We have been experiencing some urban flight—largely economically promoted. We lost families during the economic recession of 1991-93. As the economy improved, home-building in suburban areas increased.

Our students also are very mobile. During the period from October (after school settles down for the year) through June we have about 80 percent of our students staying in one school. The other twenty percent move from school to school within the district, leave, or enter the district.

Our racial-ethnic breakdown is very unusual for a larger urban district in that we are nearly balanced among the four largest racial-ethnic categories with no one category as a "majority." The groupings include twenty percent each of blacks and Hispanics, and about 30 percent each Asian and white. These

racial-ethnic figures, however, do not provide a picture of our many languages. Nearly one in four of our students is from a home in which English is the second language. The six languages that are most common include Spanish, Chinese (Cantonese), Hmong, Mien, Laotian and Russian. Yes, we have over 1,000 students from Russian-speaking homes. Many of the students who are learning English enter our schools as recent immigrants.

Given these demographic factors, including the high number of students who are learning English as a second language, it may not be surprising to learn that our student achievement scores have been declining. While some may complain that we are still using a multiple-choice achievement test as the basis for district-wide information, the fact that average scores have steadily trended downward in the past ten years cannot be debated. For those who state that our district assessment with a multiple choice test does not match our current classroom instruction, we reply that our students don't do any better on a performance test. Indeed, our experiences in the past two years with the short-lived California Learning Assessment System are that our students continue to perform poorly when compared with other districts in the state. The state assessment results do not provide any evidence that our score decline is due to an "old" multiple choice test rather than on performance measures.

This picture of student achievement for our district provides a view that is similar to that found in many larger urban districts. If the student achievement picture is not strong, how does this affect programs for which students are eligible on the basis of intelligence? If intelligence produces achievement, one might anticipate that we would find fewer gifted students and more students needing special education assistance. This is not the case. Our rate of identification for gifted programs is close to the state average of 5 percent of the students. Our identification rate for special education students with moderate to severe learning disabilities is also in line with the state average of 5 to 7 percent of the students. The next section of this report will give more information about the use of IQ tests to identify these high and low IQ groups.

Use of IQ testing to identify special education students and gifted students

First, let me set the stage for the application of intelligence measurement and student identification. We use intelligence tests of various types to screen and identify students who have trouble learning—who may be classified as learning handicapped or seriously mentally retarded. We also use a variety of intelligence tests to screen and identify students who may be exceptional learners and eligible for programs for gifted students.

These applications of intelligence measurement have little meaning for students in general. In fact, most students in California will never get near an intelligence test so the use of intelligence tests is limited to some ten to twenty percent of students.

We recognize, however, that there is a relationship between student intelligence and student learning (or student ability to learn), and have been attempting to learn more about what this relationship may be. Some of our consideration has been influenced by the ideas of self-efficacy. We also have considered an operational definition of intelligence that includes observation of how students learn, rather than the notion of intelligence as something that is defined through testing.

Special education students—Although IQ testing originated from Binet's desire to identify the mentally retarded who would be eligible for special school assistance, current California regulations prohibit the identification of students and placement in special schools or classes for moderately or severely mentally retarded on the basis of IQ tests alone. This restriction came as a result of the *Larry P.* case referred to

earlier. The impact of this restriction has been to encourage the use of a wide variety of assessments. While IQ testing is done, the student cannot be identified for services on the sole basis of an IQ score.

Because more tests and observations are required before identifying learning handicapped students, a greater amount of information is available. This assessment information could be used to provide a clearer diagnosis and prescription for individual instruction. Discussions with special education staff, however, reveal that this is not usually the case. No matter how much assessment information is available, once the student is identified for a certain level of service, it is as if he has an identifying mark implying that his needs are the same as the needs of others receiving this service. Lost to the most teachers is the wealth of available information about how the student learns best, his/her relative strengths and special instructional needs.

Gifted students--The identification of gifted students in our district creates a very different testing problem. Although more than one test is not required for identifying the gifted student, we frequently use more than one test. This situation has come about because of our desire to find the "giftedness" in students from various backgrounds--socio-economic, racial-ethnic and language. For many years our gifted program identified primarily white and Asian students, with lesser numbers of Hispanic and black students. The distribution of identified gifted students did not come close to matching the racial-ethnic distribution within the district as a whole.

Our psychologists are now using tests such as the Ravens Progressive Matrices to initiate the identification of gifted students. Students with gifted potential are further assessed with other IQ measures and assessments of task commitment and levels of creativity. Not all students are identified as gifted with the same IQ test, and fewer and fewer are identified from the once-common Stanford-Binet and WISC.

As a result of our expanded arsenal of intelligence measures, a greater amount of information about individual students, their learning styles, their relative weaknesses and strengths, etc., is available following identification than just a single score. While one would wish that this would lead to enriched and varied instructional programs for the identified gifted students, this is not usually the case. As in the case of the mentally challenged student, the instructional program for gifted students tends to be a "one size fits all" type of program. While there are some teachers who do make use of the assessment information to illuminate their work with individual students, most teachers do not individualize their instructional programs on the basis of intelligence testing.

Applications of intelligence theory: Efficacy

Implementation--During the past three years our district has embraced the efficacy program and adopted the district motto, "All students can learn." Efficacy, as we use it in our district, cuts across commonly held ideas about intelligence with its viewpoint that intelligence can be developed--that it is not fixed.

Research studies on self-efficacy began in the 1980's. The work of Bandura, Schunk and others has been instrumental in this area of study. A summary of research in the area of efficacy's application in student learning concludes with this statement:

Overall, research supports that self-efficacy plays an integral role in children's academic behavior. Feeling confident in their abilities can compel children to take on difficult tasks--in mathematics, reading, or listening comprehension, to learn skills more easily and apply strategies, to exert more effort on tasks and to persist when they encounter difficulties. (Pelletier, et al, page 40)

About four years ago the district superintendent introduced administrators to the work of the Efficacy Institute. This Massachusetts-based, not-for-profit organization provides educational consulting services to schools and community organizations. The Efficacy Institute helps teachers apply the belief that *all children can learn*. The process of development includes using key ideas and approaches, including slogans such as "ZOD" (zone of development), "strong side/weak side," "think you can," and "get smart." The Efficacy Institute, headed by Jeffrey Howard, opines not only that all students can learn, but that intelligence is not fixed. One of Howard's quotable sayings is, "Smart is not something you are, but something you get."

Underlying this point of view is the idea that smart is something that you can get, not something that some are and some aren't. In a diversified urban district with student enrollment within each of the four largest racial-ethnic groups between 20 and 30 percent, and with one-fourth of our students from homes in which English is a second language, this view is appealing. Our teachers report that they did not receive this understanding of *all students can learn* as part of their basic training, nor is it a personal belief or operational practice for many teachers.

A major district focus in staff development, therefore, has been to introduce efficacy beliefs and methods into our schools and classrooms. We began with four schools three years ago. Each year since then we have included additional schools in the efficacy training program.

The role of the teacher is to assist students in this development and to avoid practices that imply that the student cannot "get smarter." Thus, teachers would avoid the kinds of put-downs that tend to be overly-common in many schools (including many Sacramento schools). Students would be encouraged to work hard and to believe that they can learn most anything. Teachers are encouraged to assume that all students can learn what they have to teach and that no students will fail.

The principles of efficacy are that students can develop their intelligence through application and hard work. Efficacy introduces students to a process of self-exploration that enables them to better understand their personal motivations, learn how to take moderate risks, avoid negative influences and set realistic goals for their learning. Indeed, on district surveys of teacher beliefs, student beliefs and parent beliefs, we have been asking some of these questions. Questions such as "I believe that my students can learn most of what I teach," "My teacher believes that I can learn most of what he/she teaches," and "My student's teacher believes that he/she can learn what is taught in school."

Results--We are finding that the schools that have embraced efficacy through staff development and classroom application score higher in terms of teacher, student and parent beliefs about ability to learn than those in other schools who have not had the efficacy training. Participating schools are now in their third year and are beginning to find measurable improvement in student learning as a result of the efficacy program. This is not surprising as other districts such as Detroit have had similar results after adopting the efficacy model.

Students in efficacy program schools have also shown significant gains as assessed by the Student Attitude Measure (SAM). Students in the four initiating schools showed significant gains over a one-year period in their motivation for school, their sense of control and the instructional mastery.

Programs come and go in our school system. For this reason it was important to assess the level of implementation for the efficacy program. A researcher in our district developed a rubric checklist covering desired changes in instruction, instructional resources and materials, classroom organizational strategies, student assessment and teacher, parents and school relationships. This assessment checklist covers fourteen topics, assessing whether the school is judged to be in the beginning, developing, growing or

almost full development stage—or whether it is judged to be in "the zone of optimal development." After the first two years of the efficacy program, participating schools were judged to have made strong gains in moving toward "the zone."

Principals from the four pilot schools have also reported on ways in which the efficacy training has had an impact. Several noted a positive change in the way students approached learning tasks, and in the language students used to discuss learning—such as "working from their strong side, not their weak side," using the "zone of development" in which they are ready to learn new ideas, even though it may be difficult.

Beliefs about learning are not sufficient in themselves, however, if they do not affect actual learning. Achievement measured by the Comprehensive Tests of Basic Skills (CTBS) in total reading, language and math for two years was significantly higher in the second year. These findings were based on over 100 students from the initial efficacy schools.

Applications of Intelligence Theory: Multiple Intelligences

Besides efficacy, we have embraced Howard Gardner's theory of multiple intelligences. Many workshops and staff development sessions have been given to the study of efficacy and of different mental strengths and abilities. Most pertinent to the teaching situation, teachers have been urged to use a variety of learning modalities in helping students to master ideas. Teachers seem to be able to grasp that we don't all learn in the same way more easily than they adopt the concept that we all can learn to a high level.

Theories of multiple intelligence lead to applications in the classroom that reflect understanding of variations in how students learn and how they can apply their intelligence (or intelligences). Many schools and districts have adopted and adapted theories about multiple intelligences. Gardner's work has been widely interpreted and applied during the past ten years. His multiple intelligences are described by seven categories: bodily-kinesthetic, musical, linguistic, logical-mathematical, interpersonal and intrapersonal.

Many teachers have attended training sessions in which Gardner's work has been applied to classroom teaching. Teachers talk about using different "modalities" to both present instruction to students and to encourage students to learn. Several schools are using the "Integrative Thematic Instruction" model (developed by Susan Kovalik) as vehicle for applying multiple intelligence theory. Student work demonstrates the use of various learning methods. The emphasis on multiple assessments and on performance assessments of various types reflects some application of the multiple intelligences theory.

For example, students are encouraged to choose among different types of projects in order to use their learning strengths. At other times they may be encouraged to work on the development of skills that are harder for them. These applications of different learning styles also are used in assessment, with students choosing the way in which they want to demonstrate their understanding of a topic. A number of teachers in my district are using projects and portfolios as assessment techniques.

Teachers working with gifted and talented program students have been among the supporters of multiple intelligences in the district. They have found the idea of learning styles based upon multiple intelligences makes sense in the classroom. They also are helping students understand how they can build upon their areas of strength and further develop those areas that are less developed. In this respect, there is great similarity between the classroom applications of efficacy and multiple intelligences.

We have a few special education teachers using multiple intelligences theory in their work with students who have disabilities. The remedial needs of special education students seem to be so great that little

attention is given to ways in which more highly developed intelligences might compensate for the areas of difficulty.

Applications of intelligence theory: Individual Styles

Somewhat similar to Gardner's multiple intelligences is Robert Sternberg's presentation of "style." Robert Sternberg says that "A style is a preferred way of using one's abilities. It is not in itself an ability but rather a preference."

Individual styles can be applied both to the student's learning and to the teacher's instruction. As might be anticipated, mis-matches between the learning style of the student and the teaching style of the teacher can be disastrous. Although Sternberg is clear that his individual styles are not "abilities" but merely preferences, the application of his style theories can be useful in not dismissing "different" students as being less intelligent.

In our district, teachers working with gifted and talented students are those most likely to talk about learning styles. This is particularly important as we identify students as gifted on the basis of different styles or performances.

Part IV: What We Are Learning

The Good

What are some of the things we are learning about student intelligence? Among the things we are learning which are "the good" are these:

1. All students can learn.
2. Students can learn in different ways.
3. Students learn some things more easily than other things.
4. Students perform differently on different tasks.
5. Teachers need to provide a variety of learning opportunities that allow students to use different "styles" and intelligences.
6. Assessment of student achievement using multiple measures can illuminate students' abilities and intelligences.
7. Assessment with multiple measures calls for a type of triangulation of results.

The Bad

Despite the practices that we find to be good, many teachers and classrooms still reflect practices that we now term "bad," among them:

- ① The interpretation that intelligence is fixed for the individual.
- ② The individual ramifications of fixed intelligence which mean some students will always be "failures" or "will never learn."
- ③ Teachers who, in their classroom instruction, tend to develop biases about which students are capable (i.e., intelligent) and which ones are not.

- ④ Teachers who give all students the same homework assignments—whether or not they have mastered the skills needed, and without recognition of the variety of opportunities needed to acquire skills.
- ⑤ Classroom and district testing practices which have not, until recently, reflected the variety of ways in which students can demonstrate learning,
- ⑥ Classroom and district testing practices which do not combine assessments from multiple measures.
- ⑦ The inadequacy of procedures to triangulate multiple assessments into an understandable whole.

The Ugly

I classify as downright "ugly" these practices that I believe are mis-uses of the concept of intelligence:

- ① Teachers who believe that "those" students (who are on AFDC, or have a different skin color or home language) aren't as smart. This leads to a "dumbing down" of the curriculum with a corresponding slowdown in presentation and lowered expectations. The social ramifications of such prejudicial beliefs are divisive; this is not my idea of what we want in our society.
- ② In addition to the prejudicial beliefs about groups of students, there are the individual ramifications. As we find too frequently, students come to think of themselves as "dumb" or "smart" before they are very old. While those thinking themselves "smart" may not come to any personal harm, they harm others by their assumptions of superiority. And for those who come to think of themselves as "dumb," there is a tendency to give up—to let others assume responsibility. These students harm themselves because they fail to identify their own "smartness" and because they fail to accept responsibility for their own efforts to learn. This individual prejudice can also be found if the theories of multiple intelligences are used to label how students are and are not capable; rather individuals should be able to recognize that they have to work harder in some areas than in others in order to learn.
- ③ The failure to acknowledge learning as a life-long occupation may be the ugliest part of the fixed intelligence concept. Intelligence ideas are mis-used when there is a failure to acknowledge that smart is something that we can all get. To me this means that each of us can continue to develop our intelligence throughout life. Those who think of intelligence as set and schooling as over by the time they are in their teens or twenties not only are losers themselves, but they are losses to our society. Who knows what more they could learn and offer to the world were they to continue learning?

Concluding Statements

If we share our nation's Goals 2000 vision to have both "adult literacy" and "life-long learning," then we need to avoid the belief that one's intelligence is established early in life and that it cannot be developed further. We also need to recognize the many different ways in which individuals are "gifted" and show their intelligence, rather than fuss about whether one's home or heredity makes one "smart."

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